

Original Research Article

Study on Man-Power Utilization Pattern of Milking Operations in Dairy Animals

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ABSTRACT

The aim of the present investigation was to examine the man-power utilization pattern of milking operation in dairy animals. The present study was conducted on 23 selected milch animals at Instructional Livestock Farm Complex, College of Veterinary Science and Animal Husbandry, N.D.U.A.T., Kumarganj, Faizabad, U.P. The loose housing system was followed in the farm and animals were maintained within the enclosure having covered area on and around the feed manger. Hand methods of milking were performed in separate milking byre in two shifts following single row system. Man-min required under hand milking operations were recorded by a stop watch and observations were taken for 30 days. The results showed that, that time required in unit operation (sec/ Litre milk) decreased with increase in milk yield of animals. Man-second utilized for unit operation of 0-2, 2-4 and 4-6 litre milk yield group was 166.94, 90.59, and 75.80 second respectively. The average total milking time required for milk yield groups of 0-2, 2-4, and 4-6 litre was 268.77±11.10, 307.09±9.23 and 390.4±10.95 second respectively. These groups had an average yield of 1.61, 3.39 and 5.15 litre milk respectively. Similarly, for evening milking, milk yield group studied were 0-2, 2-4 and 4-6 litre which has an average production of 1.52, 3.25 and 5.08 litre milk respectively. The time required for the milking of per litre of milk for these groups was 188.76, 94.21 and 65.51 second respectively. It was observed with increase in milk yield the time required in unit operation was observed to be in decreasing order. The total time required in milking operation increased from 286.92±9.73, 306.17±12.13 and 332.8±11.84 second respectively. From the present study it may be concluded that total average time spent in hand milking operation of animals was found maximum in morning milking followed by evening milking.

Keywords

Man-power utilization, milking operation, hand milking, dairy animals

Introduction

The dairy farming is a two-stage production system, i.e., cultivation of fodder crops and management of milch animals, currently contributes about 132.4 million tones (Department of Animal Husbandry, Dairying & Fisheries, Ministry of

Agriculture, GOI) of milk and acts as a substrate to channelize energies of 143 million men and 35 million women farm workers to participate in the production process in India (Patel and Mehla, 1988). Man-power is the most critical resources

which influence the profitability of dairy farming. Judicious use of man-power is the major challenge faced by dairy farmers. Information about the man-power utilization for various dairy farm operations is essential from the viewpoint of man-power deployment and management. Studies on man-power utilization for different types of dairy farm unit seem to be a logical approach for assessing the labour requirement on dairy farming. This subject is important to the large dairy farmer because of the cost of wages; it is important to the small dairy farmer because it can help him to include other enterprises which fetch more profit to support himself and his family. It is also important to the land owner because an easily worked farm is worth more and similarly it is important to the farm worker because it increases his value. The man-power contributes approximately 20-30% of total input cost of dairy farming (Barnard *et al.*, 1982). More or less, the labour needs are evenly spread throughout the year in dairy farm operations except for the fodder related works (Barnard *et al.*, 1982). Milk harvesting is by far the most important one among the dairy farming operation. The efficient and rapid removal of milk from udder in a clean and healthy environment should be the goal of every milking programme. Milking operation is directly concerned with ability of the milker, facilities for and management of milking operations. Whipp (1981) reported that time spent in milking operation were 38% of the total man-power required in different dairy farm operations. Grazing (1965) reported that time spent in milking operation ranges from 42 to 50% of the total time spent in different dairy farm operations. Ely and Peterson (1941) reported that milk letdown and the milk flow rate are the terms frequently used while discussing milking operation. Pufz and Thomas (1940) calculated that fast milkers obtained 7.1 kg

milk in 6.68 minutes while slowest milker obtained 3.6 kg of milk in 9.1 minutes. Devarajulu & Naidu (1989) reported that milking operation took about 30% of the total time spent for milch animals under stall feeding and managerial practices. In India study on man-power utilization has been quite less in the field of dairying and other livestock farming. Therefore, very little work has been done and published so far the direct applicability at farm level is concerned. As a result labour management in livestock production is based on individual experiences and capabilities.

Materials and Methods

The aim of the present investigation was to examine the man-power utilization pattern of milking operation in dairy animals. The present study was conducted at Instructional Livestock Farm Complex, College of Veterinary Science and Animal Husbandry, N.D. University of Agriculture & Technology, Kumarganj – Faizabad (U.P.) on man-power utilization pattern for milking operation. The herd at C.V.Sc. & A.H., N.D. University of Agriculture & Technology, Kumarganj–Faizabad was used and from which 23 milch animals were selected. The loose housing system was followed in the farm and animals were maintained within the enclosure having covered area on and around the feed manger. Milking was performed in separate milking byre following single row system. Hand methods of milking were used in the milking operation. Hand milking was performed in two shifts. The milk yield of individual animals in each shift was weighed with the help of spring balance available at the unit and entries were made in the daily milk production sheet. Man-min required under hand milking operations were recorded by a stop watch and observations were taken for 30 days.

Hand milking operations

The animals under hand milking operations were observed and man-seconds were recorded. These animals were further grouped into 0-2, 2-4 and 4-6 litre milk yield on the basis of their milk yields achieved in each shift. Under hand milking the milk yield was recorded along with man-seconds required for following activities:

Pre-milking

Under premilking activity, securing of animal, concentrate supply to the animals, cleaning of animals, tying of hind leg and tail, wiping of udder and udder stimulating time (by hand) were recorded.

Actual milking

It was the time required for milking the animals completely after letdown of milk.

Post milking

It included the time required for application of udder ointments if necessary, untying of leg, let loosing the animal, coming back to the balance and weighing of milk.

Statistical analysis

The data collected were analyzed for their mean values and standard errors as per standard statistical techniques.

The data collected for different operations were also converted into unit operations like man-seconds required for per litre of milk (man-sec/Litre), time for sweeping and washing of floor (man-min/100m² area), time required in dung and feed refuse collection (man-min/100 kg) time for dung and feed refuse collection (man-min/100 m² area) etc.

Results and Discussion

Efforts have been made to ascertain time required in some of unit operations on the basis of observations and data collected during the course of study. These values may provide information for the deployment of the workers for the proper management of dairy farm operations.

Man-Power Utilization Pattern in Hand Milking Operation

Man-power utilization pattern in different operations of milking viz. tying of animal, tying of animal legs, udder washing, udder massage, milking, untying of legs, milk weightment, untying of animals and total time required in milking operations has been depicted in Table 1 and Fig. 1-6 for hand milking operations. These operations have been classified on the basis of milk yield of animals in each milking shift from 0-2 litre to 4-6 litre of yield for morning milking shift and from 0-2 litre to 4-6 litre of yield for evening milking shift in hand milking operations. It was observed that man-minutes required in pre-milking operations viz. tying of animals, tying of legs, udder washing and udder massage varied between 8.13 ± 0.57 to 11.43 ± 0.46 , 12.50 ± 0.81 to 14.76 ± 1.23 , 4.77 ± 0.18 to 5.80 ± 0.41 and 7.13 ± 0.28 to 9.20 ± 0.57 second respectively.

The minor variation within the operation might be basically due to individual variation of workers and animals. Obviously, these operations were independent of milk yield of animals in every observation. Similarly, man-minutes required in post-milking operations viz. untying of leg, milk weightment and untying of animal varied between 4.8 ± 0.81 to 6.00 ± 0.45 , 38.63 ± 0.99 to 48.1 ± 1.03 and 4.5 ± 0.81 to 6.8 ± 0.34 second respectively. It was observed that there was continued

increasing in milk weightment time with increase in milk yield. Observations revealed that there was continuous increase in milking period from 182.16±10.95 to 295.6±11.03 second and 201.6±09.77 to 245.12±11.31 second for morning and evening hand milking of animals which were grouped into 0-2 litre to 4-6 litre and 0-

20 litre to 4-6 litre. Basically due to more quantity which was to be milked it was found that morning milking took longer time as compared to evening milking and high yielding animals required more time at milking than low yielding animals. These findings were parallel to the findings of Nanda (1988) and Rai *et al.*, (1991).

Table.1 Man-power utilization in milking operation

Sl. No.	Milk yield group (l)	Average milk yield (l)	Animal tying (sec)	Tying of legs (sec)	Udder washing (sec)	Udder massage (sec)	Milking (sec)	Untying of legs (sec)	Milk weighing (sec)	Pooled time (sec)
Morning										
1	0-2 (30)	1.61±0.03	9.3±0.62	14.76±1.23	4.80±0.18	7.13±0.28	182.16±10.95	6.00±0.45	38.63±0.99	268.77±11.10
2	2-4 (35)	3.39±0.06	11.43±0.46	13.06±0.38	4.77±0.18	7.26±0.24	216.60±8.88	5.86±0.28	41.31±1.14	307.09±09.13
3	4-6 (10)	5.15±0.11	10.1±0.43	12.8±0.36	5.2±0.24	8.8±0.35	295.6±11.03	5.00±0.42	48.1±1.03	390.4±10.95
Evening										
1	0-2 (30)	1.52±0.04	8.13±0.57	14.03±1.18	4.87±0.17	7.20±0.28	201.6±9.77	5.23±0.43	38.83±0.74	286.92±9.73
2	2-4 (35)	3.25±0.08	10.29±0.73	12.94±0.71	4.91±0.19	7.63±0.22	219.83±11.84	5.69±0.48	39.34±0.72	306.17±12.13
3	4-6 (10)	5.08±0.16	9.70±1.36	12.5±0.81	5.8±0.41	9.2±0.57	245.11±11.31	4.8±0.81	41.2±1.32	332.8±11.84

Figure in parentheses indicates no. of observations.

Table.2 Time required for unit operation under hand milking

Sl.No.	Milk yield group (l)	Average milk yield (ℓ)	Total milk (ℓ)	Total time required in milking (Sec)	Average time (Sec/ℓmilk)	Average time/milking operation
Morning milking						
1	0-2 (30)	1.61±0.03	48.30	8063.10	166.94	268.77±11.10
2	2-4 (35)	3.39±0.06	118.65	10748.15	90.59	307.09±09.23
3	4-6 (10)	5.15±0.11	51.50	3904.00	75.80	390.40±10.95
Evening milking						
1	0-2 (30)	1.52±0.04	45.60	8607.70	188.76	286.92±09.73
2	2-4 (35)	3.25±0.08	113.75	10715.95	94.21	306.17±12.13
3	4-6 (10)	5.08±0.16	50.80	3328.00	65.51	332.80±11.84

Fig.1 Man-power utilization pattern of morning hand milking in 0-2ℓ milk yield group

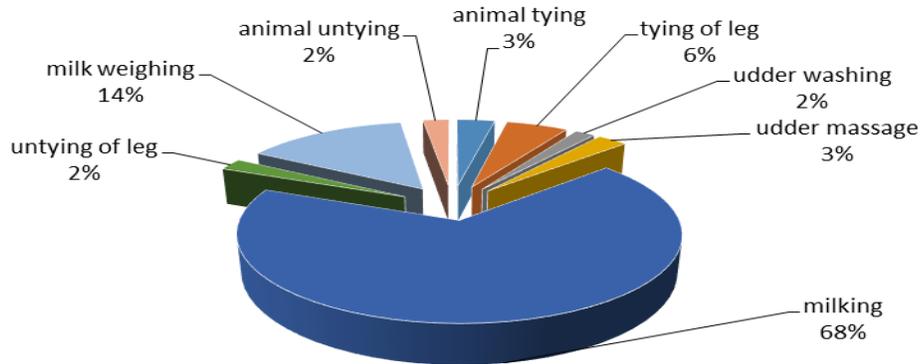


Fig.2 Man-power utilization pattern of morning hand milking in 2-4ℓ milk yield group

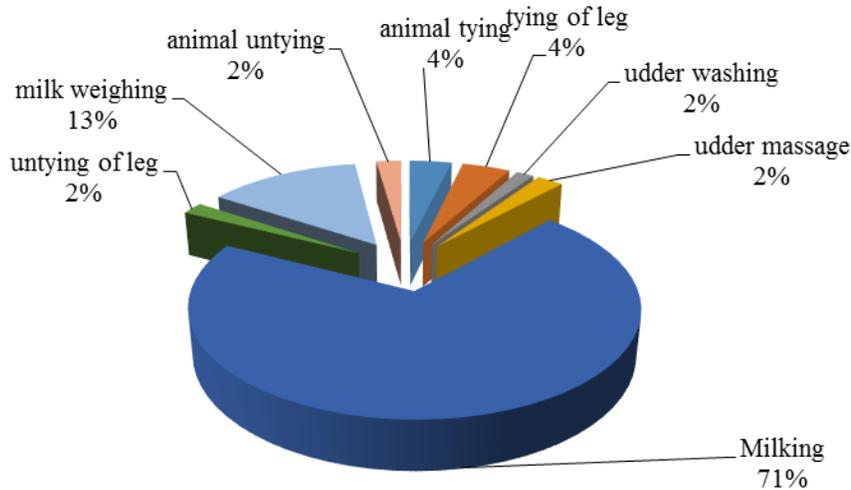


Fig.3 Man-power utilization pattern of morning hand milking in 4-6ℓ milk yield group

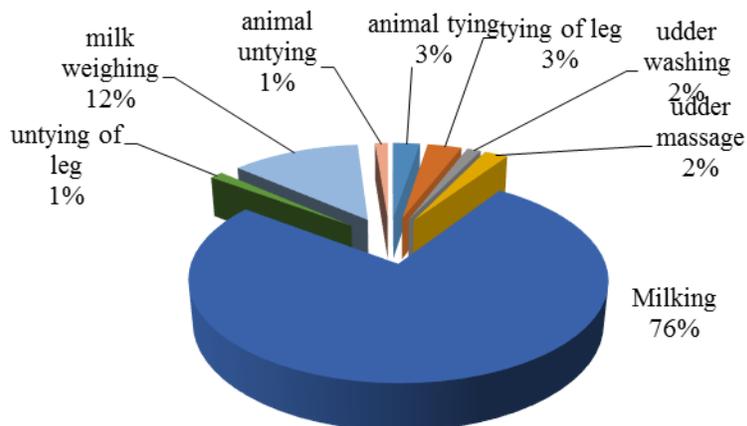


Fig.4 Man-power utilization pattern of evening hand milking in 0-2ℓ milk yield group

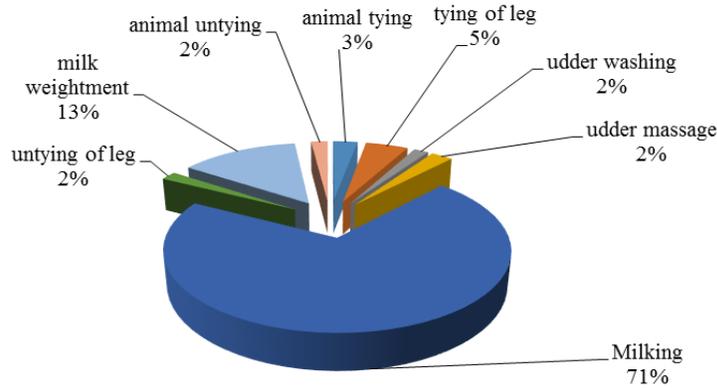


Fig.5 Man-power utilization pattern of evening hand milking in 2-4ℓ milk yield group

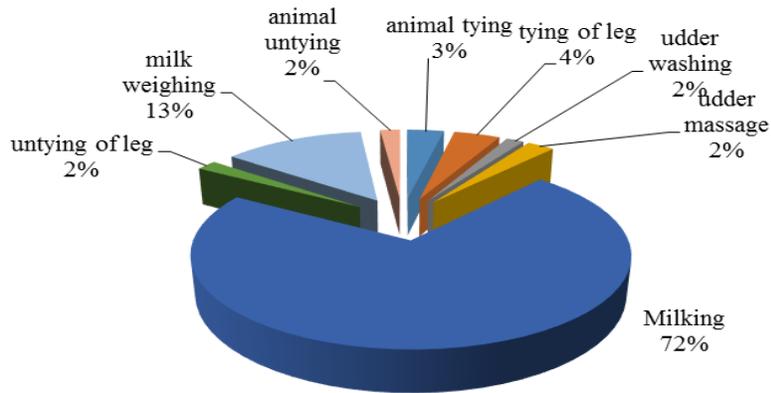
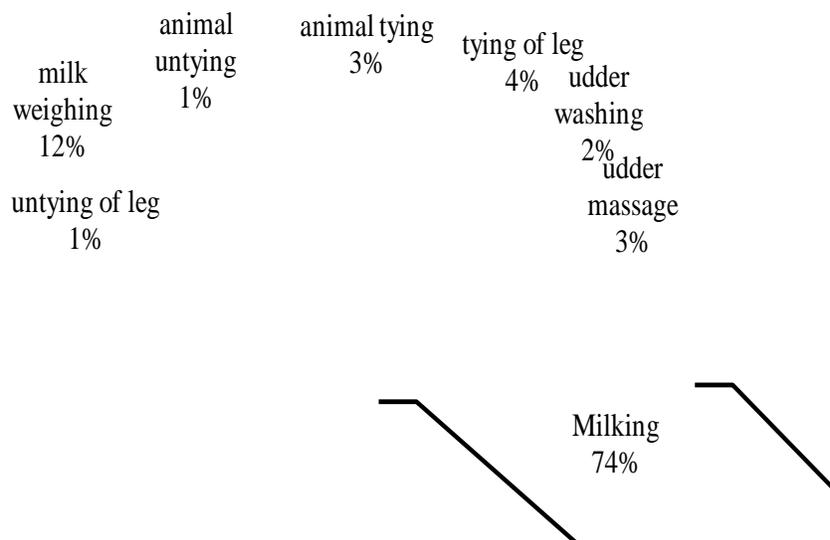


Fig.6 Man-power utilization pattern of evening hand milking in 4-6ℓ milk yield group



The pattern of man-power utilization as depicted in Fig. 1-3 and Fig. 4-6 showed percentage of time incurred in milking varied from 68 to 76% in morning milking and 71 to 74% in evening hand milking. The increase in percentage of time required was again credited to enhanced milk quantity. The enhancement in the milk quantity attributed to increase in weightment time due to overall increase in total time required in milking operation therefore observed to be percentage decrease from 14 to 12% for morning and from 13 to 12% in evening milk weightment time due to increase milking time in each milking operation respectively.

It was observed that for both morning and evening hand milking, the enhancement in total time required was not increased linearly with increasing milk yield as higher yielding animal contributed milk with enhance milk flow rates (litre /sec). The available milk yield wise (litre /animal) information can be used for deciding man-power required in milking operation of a dairy farm.

Overall Man-Power Utilization in Unit Operations

Hand milking

The total time required in the unit milking operation for different yield group of animals for morning and evening milking has been shown in Table 2. It was observed that time required in unit operation (sec/ litre milk) decreased with increase in milk yield of animals. Man-second utilized for unit operation of 0-2, 2-4 and 4-6 litre milk yield group was 166.94, 90.59, and 75.80 second respectively. The average total milking time required for milk yield groups of 0-2, 2-4, and 4-6 litre was 268.77 ± 11.10 , 307.09 ± 9.23 and 390.4 ± 10.95 second

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From the present study it may be concluded that total average time spent in hand milking operation of animals was found maximum in morning milking followed by evening milking.

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